Overview of Emissions Modeling Process

Expert Peer Panel Meeting

September 23 & 24, 2004

Baltimore Metropolitan Council

Air Quality Standards for Baltimore

Classified Severe One-hour Ozone Non-attainment Area – 2005

Classified Moderate Eight-hour Ozone Non-attainment Area – 2010

Recommended PM$_{2.5}$ Non-attainment Area

Emission Estimation

Partnership between BMC and MDE

MDE Responsibilities

- **Environmental Conditions**
- **Control Programs**
- **Vehicle Fleet Characteristics**

BMC Responsibilities

- **Vehicle Operating Characteristics (Defaults)**
- **Vehicle Operating Assumptions (Simulation) Using Travel Demand Model and Emission Post Processing Software**

ICG Coordinates Activities between BRTB, MDE, and MDOT

Mobile Emission Estimation

Off network estimate

- **Commercial Software**
- **Series of Procedures/Methods Based on Published/Documented Reports**
- **Estimates Changes in Travel Behavior (VMT, VT) or Changes in Control/Fleet Characteristics**
- **Creates/Runs M6 Input Scripts and Applies Gram/Mile Emission Factors to Changes (VMT, VT, Control Programs, Fleet)**
- **Summarizes Demand and Emissions by Strategy**

On network estimate

- **Commercial Software to Post-process Travel Demand**
- **Creates/Runs M6 Input Scripts**
- **Applies Gram/Mile Emission Factors to Travel Demand**
- **Summarizes Demand and Emissions (Jurisdiction, Facility Type, Vehicle Type, Emission Type, ..)**

Creating MOBILE6 Inputs

- **Output BMC travel model to DBF file providing**
  - **24 hour volume, am and pm peak period (total)**
  - **24 hour volume, am and pm peak period (truck)**
- **Adjust simulated VMT to HPMS average weekday by county, urban/rural, functional type based on 2000 observations**
- **Factor to summertime conditions (+4%)**
- **Estimate local VMT by County and Urban/Rural from 2000 observations**

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Creating MOBILE6 Inputs

- **Convert link 24 hour total and truck volume into each hour of the day**
  - **SHA/local 24 hour counts by urban/rural and functional type**
  - **Control am and pm peak periods to total volume and truck volume simulation**
  - **Peak adjust over simulated links (1.3) for peak period apportioning over simulated volume to adjacent 3 hours**

Creating MOBILE6 Inputs

- **Convert hourly volume and truck volume to 4 vehicle types (hourly class counts 99-02)**
    - **Cars (LDV & LDT)**
    - **Motorcycles**
    - **HDV (HDV2B - HDV8B)**
    - **Bus (Transit and School)**
- **Adjusted truck volume to match link simulated 24 hour, am and pm peak periods**

Creating MOBILE6 Inputs

- **Convert total VMT estimates for 4 vehicle types to 16 vehicle (gas – diesel combine) based on MOBILE defaults**
- **2000 16 vehicle type shares**
- **LDV Group LDV= .5649, LDT1=.0747, LDT2=.2485, LDT3=.0767, LDT4=.0352**
- **MC Group MC=1.000**
- **HDV Group HD2b=.3325, HD3=.0332, HD4=.0254, HD5=.0193, HD6=.0717, HD7=.0857, HD8A=.0945, HD8B=.3377**
- **BUS Group HDBS=.6786, HDBT=.3214**

Creating MOBILE6 Inputs

- **Develop MOBILE6 Transportation Operating Assumptions for each County, Urban/Rural, and Functional Type**
  - **Develop total VMT by Hour (24 hours)**
  - **Develop 24 hour speed (14 bins)**
  - **Develop total VMT by Hour, Functional type (Freeway, Arterial, Local, Ramp), Vehicle Type (28)**
  - **Develop total VMT by 16 vehicle type**

Creating MOBILE6 Inputs

Execute MOBILE6 Creating Database and Standard Report for Each County, Urban/Rural, and Functional Type

Using MOBILE6 Database Output

- **Estimate VMT Totals for 28 Vehicle Types**

- **Estimate Emissions Using Composite Factor for 28 Vehicle Types for VOC, CO, and NOx**

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